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Below this amount the animal may be more or less fatigued, but he does not die. In the rabbit 90 cc. cannot be injected without producing immediate death, but this may come on with smaller doses, between 70 and 80 cc. per kilogramme of body weight. In doses below 100 cc. the dog survives, but with the rabbit, below 70 cc., and even at 45 cc., the animal may survive or not, showing besides an immediate toxicity a remote toxicity. If these two kinds of toxicity are considered, it is seen that in the rabbit the degree of toxicity oscillates between 45 and 90 cc. per kilogramme of body weight, being on the average 67 cc. The effects of the urine were in general the same in the dog and in the rabbit. Taking the rabbit as a type, it is found that in all doses, even when the amount injected does not exceed 25 cc. per kilogramme of body weight, myosis is produced, but in small doses the myosis is but little marked, and is transitory; with larger doses it is more persistent, and the pupil becomes punctiform. With all doses there is abundant and clear micturition, which may be equivalent in quantity to the amount injected. The animal also shows thirst. Respiration is slowed. There is constant subnormal temperature, even to 3° or 4° C. Troubles of the nervous system consist, according to the doses, in somnolence, coma and epileptiform attacks, preceded or not by convulsive movements.

In studying the different constituents of the urine, to find the cause of the toxicity the authors conclude that it is the coloring matters that exert the chief toxic effect. To the objection that the coloring matters include at the same time some alkaloids, the authors cite the experiments of Pouchet and of Bouchard, to the effect that these substances are present in very feeble quantity in the urine, and Bouchard states that they have no influence on the toxicity of the urine. As regards the ptomaines, *Æscher* and *Corninck* state that they did not find these in normal urine. The coloring matters are, therefore, the essential cause of the toxicity of the urine. The salts of potassium also aid in the toxic effect, while the urea, the salts of sodium and potassium, and the water, have an effect on the micturition, while the salts and the water aid in the respiratory troubles, and the salts of sodium in the circulatory troubles.

*MAIRET ET BOSC, Alienation mentale par troubles de la nutrition, preuves expérimentales de l'existence de ce genre d'alienation, Annales medico-psychologiques 1892.*

In attempting to ascertain the genesis of certain cases of mental alienation and to study their causes, it is found that these cases are developed subsequent to some grave physical disease, such as typhoid fever, or during the puerperal state, or again at certain periods of the evolution of life, as at puberty.

In these cases it is natural to connect the insanity with these physical perturbations, and this with all the more reason since no other cause is found susceptible of explaining the mental alienation, and that the form and evolution followed by this mental disturbance have special features. The majority of clinicians admit this subordination. Yet the opinion has its adversaries, and is lacking in scientific proof. The authors claim that they have furnished this proof by experiments made of the toxicity of the urine of the insane. In this connection they have studied successively the toxicity of the urine of patients affected with mania, stupor, melancholia, the insanity of persecution, and senile dementia. As much as possible of the 24 hours' urine of these patients was collected, and from this was taken the quantity necessary for the experiments. As subjects of experiment, the dog and rabbit were used, more particularly the dog, whose nervous system is more developed, and whose reaction is more sensitive and more complete than that of the rabbit. The intravenous method was used, according to the rules for-

mulated by the authors in their researches on normal urine (*Comptes rendus de la Société de Biologie*, Dec. 13, 1890, and in the *Archives de Physiologie*, April, 1891). The results obtained with normal urine served for comparison of the effect of pathological urine, the results being tabulated for comparison. The comparison was made from two points of view, from that of the degree of toxicity and from that of the toxic qualities, i. e., of the action of the urine on the different functions of the economy, digestive tract, respiration, circulation, temperature, pupils and nervous system. In the first part they analyze the principal results obtained for each form of mental alienation, referring for details to a work they are about to publish on the toxicity of normal and pathological urine. In the second part they compare the results with each other in making the synthesis. They claim that this synthesis furnishes the scientific proof that the physical perturbations that they describe may give rise to the mental alienation, and they establish the nature of this alienation. The experiments on the urine of maniacal patients were conducted on thirty-three patients, twenty-five of the agitated type, eight being quiet. In mania without agitation five experiments were made on rabbits and three on dogs. In the two cases the results had a great resemblance to those for normal urine. The urine of non-agitated maniacal patients was, perhaps, a little more energetic in the sense that in the dog for example, myosis was produced by doses which normal urine did not produce, and the enfeeblement was more marked.

In mania with agitation the results are divided into two groups, the division being independent of the agitation. From the first group of ten patients the urine of three patients was injected into rabbits, and of seven into dogs. The results were in general the same in the two species of animals.

In comparison with normal urine the following facts came out: (1) As regards the degree of toxicity. The urine of agitated maniacal patients is considerably more toxic than normal urine. In the rabbit with normal urine death was never produced with less than 45 cc. per kilogramme of body weight, while with the urine of agitated maniacs, death followed twice with 25 cc. Again, in the dog it took 100 cc. of normal urine to kill the animal, while 30 cc., and even 25 cc., sufficed when the agitation was considerable. (2) As regards the characteristics. In general these are the same for myosis, micturition, respiration, circulation, temperature, nervous system, the manner of death, and the pathological findings. There was a little less hyper-excitability, and a slight hyperæsthesia at the upper part of the limbs. The urine of this first group of maniacal patients showed but little difference from normal urine, except in its greater toxicity.

The second group consisted of fifteen experiments on the urine of four patients, in whom the agitation was considerable, but not surpassing that of the patients of the first group, of whom four, in particular, were in a state of excessive agitation. Compared with normal urine this second group showed a considerable increase of toxicity, 25 cc. sufficing to kill the rabbit at once.

With regard to the characters of the toxicity the action of the pupil was more intense than with normal urine. Urinations were less frequent. Respirations were affected in the same manner, but the convulsive troubles are still more marked. The circulation is disturbed in the same manner. Body temperature is in general subject to the same modifications, i. e., there is a subnormal temperature, but the fact is less constant; in some cases, on the contrary, there is a rise of temperature.

On the side of the nervous system, together with similar symptoms, among which is weakness, the following differences are to be noted:

1. A high degree of convulsibility. The attacks, even in the dog, succeed each other rapidly, the slightest touch on any part of the body of the animal producing convulsive seizures, which may, in certain cases, become generalized.

2. An enormous muscular and tendinous hyperexcitability, and a very marked hyperaesthesia. Comparing the effects of the urine of the second group with that of the urine of the first group, it is found, with regard to the degree of toxicity, that these two kinds of urine resemble each other, while with regard to the toxic qualities there exist between them the same differences that were found in normal urine. Further, while in the first group the toxicity of the urine is notably diminished, disappearing even when a quiet period comes on; in the second group this toxicity may continue again very marked and with the ordinary characteristics, even when the patients are calm.

3. Stupor. The experiments are here divided into two groups relative to their toxicity; the first group is formed by cases of simple stupor, the second by cases of melancholic stupor. In simple stupor the degree of toxicity is a little more marked than normal; 60 cc. per kilogramme of body weight are sufficient to produce death, where it required 100 cc. of normal urine. The toxic qualities are in a general manner similar to that of normal urine. The sole difference, apart from the temperature, which may be affected in another manner, consists in a muscular hyperexcitability. In melancholic stupor nine experiments were made, six upon dogs, three upon rabbits. With regard to the degree of toxicity this is considerably increased; 25 cc. sufficed to kill a dog. The toxic qualities are the same for the other functions of the body except the nervous system, but here there are other symptoms manifested by inquietude and by stupor, resembling the condition of the patients who have furnished the urine. The action of the urine of melancholics compared with that of normal urine shows both resemblances and dissimilarities. The dissimilarities are with regard to temperature, which varies in both directions more than with normal urine; secondly, a diminution or even abolition of the sensibility, not occurring with normal urine; thirdly, psychomotor troubles; fourthly, the degree of toxicity of the urine of melancholia is considerably greater than with normal urine, 30 cc. and even 25 cc. sufficing to produce death. The greater toxicity and these different qualities have no relation with the density. In the insanity of persecution, when the individual is not agitated the toxic qualities are the same as in normal urine, but when the individual is agitated the toxic qualities are a little greater. The urine of senile dementia presents no special characteristics.

The following are the conclusions with regard to the degree of toxicity: In all the forms of mental alienation except senile dementia, the degree of toxicity of the urine is increased, but in very different proportions, according to the form of alienation and according to the acuteness of the disease. While in mania without agitation there is a degree of toxicity similar to that of normal urine, and in simple stupor and the insanity of persecution there is a relatively feeble degree of toxicity, melancholic stupor, melancholia, and mania with agitation on the contrary have a much greater toxicity. The form of the disease seems to be only a secondary element in the toxicity of the urine, the primary element being the intensity of the disease. In mania when the patient is agitated the toxicity of the urine is considerable; when he is calm his toxicity does not exceed the normal. With regard to the toxic qualities the experiments may be divided into two groups; in the one there are symptoms which do not exist in normal urine; in the other there are no new symptoms, but certain troubles which are produced by normal urine assuming an exaggerated importance.

In the second group there belong mania with agitation, simple stupor, and the insanity of persecution. In these cases, in fact, apart from a certain degree of muscular hyperexcitability and a slight amount of hyperæsthesia, the symptomatology is similar to that of normal urine, the enfeeblement and the prostration simply being more marked.

In the first group belong mania through nutritional troubles, melancholic stupor and melancholia. The cases of mania of this group show a hyperæsthesia, a muscular and auditory hyperexcitability, and a state of convulsibility that is not found with normal urine.

In cases where the pathological urine only reproduces the symptoms of intoxication by normal urine the degree of toxicity is closely connected to the greater or less intensity of the disease. In mania it is associated with the agitation, in stupor to the depression. When, on the contrary, the pathological urine gives rise to new symptoms, the toxicity persists in its principal characteristics, although the intensity of the disease has diminished, and only disappears when the individual has completely recovered his normal state. Consequently, while in the first case the toxicity of the urine is associated, not to the cause of the disease itself, but a secondary element—the acuteness, in the second case it is intimately associated with the disease itself. There is thus an essential difference between the diseases of the second group and those of the first. Studying these two groups from the etiological point of view, the causes may be divided into two groups: the ordinary causes of the neuroses, and secondly, such causes as infectious diseases, the puerperal state, puberty, etc.

Associating these etiological facts with those obtained from experimentation, it is seen that those cases which have as causes the ordinary causes of the neuroses, are those in which the toxicity of the urine is allied to a secondary element, agitation or depression, while those which are caused by a profound mental trouble are the cases in which the toxicity of the urine appears to be allied to the cause of the disease itself. Experimentation, therefore, appears to confirm that which is indicated by the study of the causes, and to show the existence, in addition to the neurotic mental alienations, of mental affections of another character. Experiments, however, do not warrant us in going farther and determining the exact nature of these mental alienations. It is of little consequence what physical cause has given rise to the insanity, the puerperal state or infectious diseases, the urines always produce the same toxic phenomena. Consequently, it is not to the typhoid or puerperal poison, for example, that it is necessary to assign the mental alienation, but to some other element common to all these perturbations, and as the sole common element is the trouble brought on by nutritive disturbance, we are forced to assign these mental alienations to this trouble. Consequently, in addition to nervous mental affections, a place should be assigned to *mental affections through troubles of nutrition*. The experiments, therefore, appear to the authors to have a double interest. (1) They confirm scientifically the opinion that certain physical disturbances may give rise to mental alienation. (2) They unite in the same group, *mental alienation through troubles of nutrition*, the mental alienations studied by authors under the different names which have been the causes capable of producing them: puerperal insanity, insanity of pubescence, etc.

FOLSOM, *Some points regarding general paralysis*, Boston Med. and Surg. Journal, Sept. 3, 1891.

Of the many divisions of general paralysis into several clinical types, all of them naturally more or less arbitrary, Folsom considers Meynert's